



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,754	12/16/2003	Jefferson Ys Yang	MR2863-142	3355

4586 7590 09/19/2006

ROSENBERG, KLEIN & LEE  
3458 ELLICOTT CENTER DRIVE-SUITE 101  
ELLICOTT CITY, MD 21043

EXAMINER
----------

NDUBIZU, CHUKA CLEMENT

ART UNIT	PAPER NUMBER
----------	--------------

3749

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/735,754

Applicant(s)

YANG ET AL.

Examiner

Chuka C. Ndubizu

Art Unit

3749

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12/16/2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 1- 4 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al 6,909,301 in view of Gruenwald 6,630,648. Yamaguchi teaches the invention as claimed (see Figures 1, 3 and 4), a control system for a catalytic combustor comprising; a catalytic bed 10, which is supplied with methanol (from tank 13) by a heating fuel supplying pipeline 19 in communication with a heating fuel storage tank 13 for heating up a chamber 9; a blowing device 5, for providing an air flow via an air flow pipe 29 to the chamber 9; at least one temperature sensor 34, for detecting an internal temperature of the chamber and generating a temperature signal; and a controller with a microprocessor 31 (Fig 1B) for controlling the heating device and the

Art Unit: 3749

blowing device in correspondence to the temperature signal generated by the temperature sensor (column 4 line 5-10 and column 3 line 65-67); wherein the microprocessor is further coupled with a parameter storage unit (RAM and ROM) for storage of parameters (column 3 line 59-64) comprising a temperature reference (column 6 line 1-20), and an air flow reference (column 5 line 64-66); wherein the microprocessor is further coupled with a setting unit for setting at least one parameter to be stored in the parameter storage unit (column 3 line 59-65, Fig 3); , wherein the heating fuel supply pipeline further comprises a control valve which is driven by the microprocessor to regulate the heating fuel supplied to the heating device (Fig 3 , S108); wherein the microprocessor transmits an air flow control signal via a driving circuit to the blowing device for controlling the air flow (Fig 1B and column 3 line 65-67).

However, Yamaguchi does not teach that the heated chamber comprises of hydrogen canisters, which are heated to discharge hydrogen from the hydrogen storage canisters via a hydrogen supplying pipeline; wherein the hydrogen supplying pipeline further comprises a flow meter for detecting the flow of hydrogen in the hydrogen supplying pipeline; and the controller controls the hydrogen flow and holds a hydrogen flow reference; wherein the heating fuel control valve is a proportion integral derivative valve.

Gruenwald discloses in a device for dispensing hydrogen (see Fig.1), the device comprising storage modules 14-17 each module heated individually by electric heating device 18 and thereby discharge hydrogen gas (column 3 line 15) through a hydrogen supply line 20; wherein the hydrogen supply pipeline further comprises a pressure

gauge 12 and valve 11 for detecting the flow of hydrogen in the hydrogen supply pipeline (column 3 line 14-20); a control system which controls to the hydrogen flow valve and the heating device (column 2 line 54, 55; column 3 line 12-15, 25-30, 61-64).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Yamaguchi's device by including the limitations disclosed by Gruenwald and recited above in order to provide a catalytic combustor which prevents the discharge of unburned fuel and which rapidly increases the temperature of the chamber as taught by Yamaguchi (column 1 line 42-44).

With regard claim 9, the fuel control valve being a proportional integral derivative type is deemed a design choice and it is given little patentable weight.

2. Claims 5, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of Gruenwald and further in view of Foust 5,149,260. Yamaguchi in view of Gruenwald teaches the invention as claimed and as discussed above.

However, Yamaguchi in view of Gruenwald does not teach a device comprising a preheat device for heating the fuel in the fuel supply line; and a nozzle section, which has an inflow end in communication with the air flow leading pipe for conveying the air flow into the nozzle section, an outflow end in communication with a heating gas drawing pipe connecting to the heating gas inflow end of the catalyst bed, and a heating fuel inlet connecting to the heating fuel supply pipeline; wherein when the air flow flows through the nozzle section, the heating fuel in the heating fuel supply pipeline is sucked

Art Unit: 3749

into the nozzle section to mix with the air flow forming an atomized heating gas, the atomized heating gas being further supplied via the heating gas drawing pipe to the catalyst bed to generate a hot gas, so that the hydrogen storage canister contained in the canister containing chamber is heated to discharge hydrogen; wherein the heating device further comprises a coiled pipe around an inner surface of the canister containing chamber, one end of the coiled pipe being connected to the heating fuel supply pipeline and the other end being connected to a heating fuel inlet at the nozzle section, such that the heating fuel is conveyed from the heating fuel supply pipeline via the coiled pipe and the nozzle section to the catalyst bed where the heating fuel is combusted to generate a hot gas for heating the heating fuel in the coiled pipe.

Foust discloses in a device for burning oil (see Fig 1 and 2), a pre-heater 167 to heat the fuel supply line 164, a nozzle section 22, 20, wherein the flow of air sucks in the fuel and atomizes it and the mixture of fuel and air enter the combustion chamber and burns; wherein heat produced in the chamber heats the walls of the chamber including the injection unit 18; wherein the supply fuel line 42 comes in a coiled pipe in and out 44 of the injection unit 18 where the fuel is further heated up before being atomized at the nozzle (see Fig. 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the heating device of Yamaguchi in view of Gruenwald by providing means for preheating the fuel supply line twice as disclosed by Foust and recited above in order to obtain a catalytic combustor which rapidly increases the temperature of the chamber as taught by Yamaguchi (column 1 line 42-44).

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of Gruenwald and further in view of Wada et al 4,451,228. Yamaguchi in view of Gruenwald teaches the invention as claimed and as discussed above except for the fuel storage tank having a fuel level sensor.

Wada teaches in a burner (see fig. 3), the burner comprising a liquid fuel tank with a liquid fuel level sensor 16 and a control system that responds to the output of the sensor (column 2 line 65-68).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the heating device of Yamaguchi in view of Gruenwald by including a liquid level sensor in the fuel tank in order to warn the user of the decrease in liquid fuel in the tank as taught by Wada (column 3 line 12-15).

### ***Conclusion***

The prior art made of record in the attached USPTO 892 and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuka C. Ndubizu whose telephone number is 571-272-6531. The examiner can normally be reached on Monday - Friday 8.30 - 4.30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg can be reached on 571-272-4828. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3749

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Chuka C Ndubizu  
Patent Examiner  
AU 3749



Ehud Gartenberg  
SPE  
AU 3749

20060914

**EHUD GARTENBERG**  
**SUPERVISORY PATENT EXAMINER**